تم الرفع بواسطة م.معن ابوعيسى

معن قحدان

Palestine Technical university
Communication engineering
Electromagnetic waves First exam

03/06/2012 **duration 60 min**

Q1) a)What is a TEM wave (7 marks)

b)what is meant by polarization of a plane wave

c)Define propagation constant, attenuation constant ,and phase constant

d)What is meant by skin depth

e)Define pointing vector and state pointing theorem

f)What is a standing wave

Q2)Assuming that the sea water have $\sigma=4$ S/m ,$\varepsilon_r=80$, $\mu_r=1$ .The magnetic field intensity of a linearly polarized uniform plane wave propagating in +y direction is given by:

$H(0,t)=a_x 0.1\sin(10^{10}\pi t-\pi/3)$ (A/m) at y=0

a)Calculate the phase velocity b)the wave length c)the skin depth d)the intrinsic impedance

e) write the expression of E(y,t) ,H(y,t) at (0,t) and at (1m,t)

f)find the distance at which the electric field is 5% of its value at y=0.

Q3)Given a uniform plane wave in air (8 marks)

$E_i = 40\cos(\omega t-\beta z)a_x-30\sin(\omega t-\beta z)a_y$ (V/m)

a)Write the expression for Hi

b)If the wave encounters a perfectly conducting plate normal to the z-axis at z=0 find the reflected waves Er , Hr

c)What are the total E&H fields for $z\le 0$

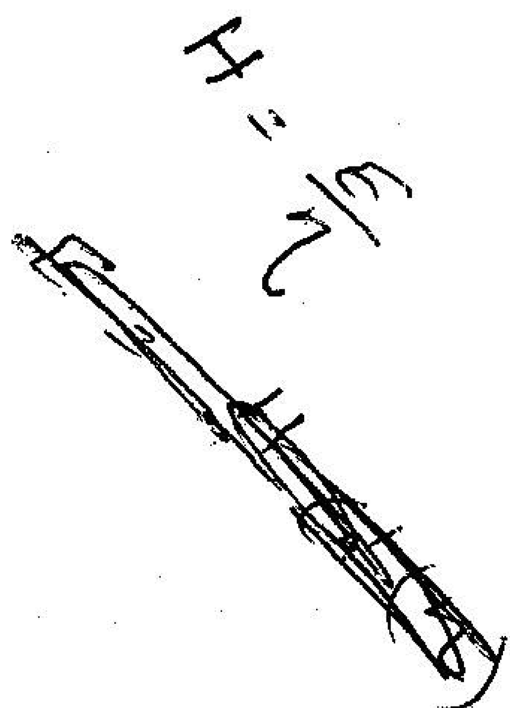
d)What are time average pointing vectors for $z\le 0$ and $z\ge 0$

Q4) A plane wave in a non magnetic media has an electric field (5 marks)

E=50sin(10^8 t +2z)ay v/m

Find

a)H b) wave length and εr c)What is the direction of propagation



Good luck
Mahmoud Ahmad

صوتيات وامواج كهرومغناطيسية
م. محمود الاحمد
امتحان اول